Lower Mississippi River Valley Land Use Affects Soil Aggregation

Surface water contamination, soil erosion, and groundwater depletion are major environmental issues facing the Lower Mississippi River Valley (LMRV). Reducing erosion and maintaining water quality depends on keeping excess sediment and potential aquatic pollutants in place on the terrestrial landscape.

To maintain agricultural productivity and the future sustainability of soil and water resources in the LMRV, researchers need to identify land use attributes and agricultural management practices that increase aggregate stability.

In a recent *Soil Science Society of America Journal* article, researchers evaluated the effects of common land uses [i.e., native prairie, deciduous forest, coniferous forest, Conservation Reserve Program (CRP) grassland, and conventional-tillage (CT) and no-tillage (NT) agriculture], aggregate-size class, and soil depth on aggregate-stability-related properties in fine-textured loessial and alluvial soils in the Arkansas Delta region of the LMRV.

Three land uses—including native prairie, CRP, and coniferous forest—were similar to each other in total water-stable aggregate concentration and mean weight diameter in the top 10 cm. These three land uses were also 35 and 70%, respectively, greater than those of the NT and CT agroecosystems, which did not differ.

Grasslands and forests generally had greater aggregate stability in the top 10 cm than agroecosystems, even after 15 years of continuous NT. Grassland and forest restoration may improve aggregate stability and indirectly decrease the risk of soil erosion and surface water contamination while also increasing infiltration and enhancing the opportunity for groundwater recharge in the LMRV.